FINAL PLAN OF REMEDIAL ACTION

Kaneka Delaware Corporation

Delaware City, Delaware

DNREC Project No. - DE-1292

December 2003

Department of Natural Resources and Environmental Control
Division of Air and Waste Management
Site Investigation and Restoration Branch
391 Lukens Drive
New Castle, DE 19720 - 3774

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1.0 INTRODUCTION

The Kaneka Delaware (site) is located at 1685 River Road (Delaware Route 9), New Castle County, Delaware (Figure 1).

In order to determine the potential for environmental liability, obtain a Certification of Completion of Remedy (COCR), and in accordance with applicable laws and regulations; Kaneka Delaware Corporation (owner) entered into the Delaware Department of Natural Resources and Environmental Control (DNREC) Voluntary Cleanup Program (VCP) under the provisions of the Delaware Hazardous Substance Cleanup Act (HSCA), 7 Del. C. Chapter 91. Through a VCP Agreement, the owner agreed to conduct a remedial investigation (RI) to characterize the risks posed to public health, welfare and the environment. The owner contracted Environmental Alliance, Inc. (EA) to perform the RI of the site. The purpose of the RI was to: 1) understand the nature and extent of any soil and groundwater contamination on the site, 2) evaluate risks to public health, welfare and the environment associated with any identified contamination, and 3), identify and recommend a remedial action, if required by DNREC.

This document is DNREC's final plan of remedial action (final plan) for the site. It is based on the results of the previous investigations performed at the site. This final plan is issued under the provisions of the HSCA and the Delaware Regulations Governing Hazardous Substance Cleanup (Regulations). It presents the Department's assessment of the potential health and environmental risks posed by the site.

In November 2003, DNREC issued a proposed plan of remedial action (proposed plan) for the site based on the previous investigations. As described in Section 12 of the Regulations, DNREC provided notice to the public and an opportunity for the public to comment on the proposed plan. At the comment period's conclusion, DNREC reviewed and considered all of the comments received, and then issued this final plan. The final plan designates the selected remedy for the site. The proposed plan, all prior investigations of the site, the comments received from the public (none were received); DNREC's responses to those comments, and the final plan will constitute the remedial decision record.

Section 2.0 presents a summary of the site description, site history and previous investigations of the site. Section 3.0 provides a description of the remedial investigation results. Section 4.0 presents a discussion of the remedial objectives. Section 5.0 presents the final plan of remedial action. Section 6.0 discusses public participation requirements and Section 7.0 presents the Director's Declaration.

2.0 SITE DESCRIPTION AND HISTORY

Kaneka Delaware Corporation (KDC) has owned the Kaneka Delaware Site (Site) since 1996 and has operated as a manufacturer of polyvinyl chloride (PVC) located at 1685 River Road (Delaware Route 9), Delaware City, Delaware (see attached site location map). The site consists of approximately 24 acres of land. KDC plans to dissolve the Delaware plant by the end of the 2003 fiscal year, in order to accomplish this they have entered into the Department of Natural Resources and Environmental Control's Site Investigation and Restoration Branch (DNREC-SIRB) Voluntary Cleanup Program (VCP) to conduct a remedial investigation of the property.

The investigation results showed that the site was minimally contaminated. KDC has opted to remediate above and beyond the requirements of DNREC to include several of the proposed remedial actions that were listed in the proposed plan of remedial action.

The site is located at 1685 River Road, in Delaware City, New Castle County, Delaware. The site consists of approximately 24 acres within one tax parcel, New Castle County tax parcel number 12-003.00-015.

Site and Project History

The Site has been an industrial site since the mid 1960s and contains office buildings, chemical storage and process areas, a wastewater treatment plant, roads, railroad tracks, and parking lots and is surrounded by a chain link fence. Access to the property is gained via two primary entrances that are monitored by a guard house. The facility is classified as a RCRA small quantity generator of hazardous waste. The site is bounded generally by industrial complexes, Oxychem plant to the north, Motiva to the south, Route 9 to the west and the Delaware River to the east (Figure 2).

3.0 INVESTIGATION RESULTS

The investigation results indicated that the majority of the 51 individual sample locations showed little contamination at the site. A few soil sample results were above the Uniform Risk-Based Standards (URS) for a restricted use (i.e., commercial/industrial). The URS are guidance values against which DNREC evaluates remediation of the contamination. The contaminants of concern included tetrachloroethylene (PCE), phthalates and polynuclear aromatic hydrocarbons (PAHs). The results showed that there are three areas of concern: 1) soils impacted with PCE located in the area south and east of the Utilities Building (near the center of the site), 2) phthalate-impacted soils within the containment area of the former plasticizer above-ground storage tanks (ASTs) near the west fence line of the property, and 3) soil/sediment impacted by contaminants located in the North Ditch. In addition, the groundwater is contaminated with PCE. The plume of PCE has not migrated off-site and the plume is showing chemical compounds associated with degradation of the PCE, indicating that the PCE is degrading through natural attenuation of the groundwater at the site.

3.1 General Information

The site consists of approximately 24 acres and is currently occupied by office buildings, chemical storage, process areas, waste water treatment plant, roads, rail lines and parking lots. The site is approximately 75 percent covered by either buildings and/or paved parking areas. All surrounding buildings and structures are currently connected to public water.

3.2 Site Soils

The soils at the site are the Matapeake/Sassafras soil association. The soils consist of silt loam with in the top few tens of inches of depth grading to a sandy loam below. There are also areas of fill material on the site.

As part of the RI conducted by EA, fifty-nine (59) initial sample locations determined based on previous data and information known about activities at the site. Additional locations were determined based on the sample results from the first sampling event.

All the samples were collected using direct-push borings (Geoprobe®) or hand auger methods. Soil samples were collected from 0 to 2 feet below ground surface, and between 2 and just above groundwater elevation. All the samples were screened by the DNREC laboratory prior to making selections to send to Lancaster Laboratories for confirmatory analysis.

PCE was detected in samples S-26 and S-27, at concentrations of 22,000 and 11,000 ug/kg respectively. This is not above the URS value of 110,000 ug/kg. These levels were addressed to ensure that the contamination was not contributing to the groundwater contamination. Phthalates were detected in sample S-17 at 880,000 ug/kg, which is above the URS value of 410,000 ug/kg.

3.3 Groundwater

Seven (7) original groundwater sample locations were selected based on potential known past activities, runoff areas, up gradient and down gradient areas of the site. One (1) surface water and nine (9) sediment samples were also collected during the RI. Monitoring wells were installed using 10 feet of 2 inch diameter 0.02 inch slot PVC well screen. The wells were surveyed for elevation and mapped by a licensed surveyor.

The results of shallow groundwater sampling at the site indicated that groundwater beneath the site contains concentrations of Volatile Organics, most notably PCE, and some metals, which exceed the URS for groundwater. PCE was identified in wells MW-5 (200 ug/L), MW-6 (77 ug/L), MW-3 (23 ug/L), and MW-2 (3 J ug/L). The concentrations of PCE in wells MW-5, MW-6 and MW-3 exceed the Maximum Contaminant Level (MCL) of PCE in groundwater of 5 ug/L. Monitoring wells MW-1, MW-4 and MW-7 were non-detect for PCE.

Concentrations of metals (aluminum, beryllium, iron, manganese, and lead) were greater than the URS for groundwater in several of the samples. In general, concentrations of total metals were greater than dissolved metals indicating that the results were because of suspended sediments in the samples.

The area is served by a public water supply system. There are no known users of local groundwater or water supply wells near the site. There is a north-south trending ditch on the eastern side of the site that likely receives groundwater discharge from the site. The ditch drains to the Christina River approximately one-quarter mile north of the site. Several wetland areas are located to the northeast, east and southeast of the site.

3.4 Summary

The results of the investigations indicated that the site contains elevated concentrations of PCE, Phthalates, and PAHs in the soil samples that exceeded the DNREC URS values for restricted use. Several samples contained arsenic at a concentration greater than the URS value for restricted use, a number of the soil samples also contained contaminant concentrations greater than the URS for unrestricted use, but below the restricted use URS.

The results of shallow groundwater sampling at the site indicated that groundwater beneath the site contains concentrations of metals and VOCs , which exceeded the DNREC URS for groundwater.

There are no known users of local groundwater or water supply wells near the site and groundwater is not considered a human health pathway of concern for this site, however, there is a potential for there to be an ecological receptor in the Red Lion Creek since the Columbia Aquifer groundwater flows to the north toward the creek.

4.0 REMEDIAL ACTION OBJECTIVES

According to Section 8.4 (1) of the Regulations, site-specific remedial action objectives must be established for all plans of remedial action. The Regulations provide that DNREC set objectives for land use, resource use, and cleanup levels that are protective of human health and the environment.

Qualitative objectives describe, in general terms, what the ultimate result of the remedial action, if necessary, should be. The following qualitative objectives are determined to be appropriate for the site:

- Control potential human exposure (dermal, inhalation and ingestion) to impacted soils;
- Control potential ecological exposure to impacted groundwater;
- Control potential erosion of impacted soils to the Delaware River; and
- Control the flow of groundwater contaminated by metals and PCE into the Delaware River and Red Lion Creek above the Delaware Surface Water Quality Standards.

These objectives are consistent with the current use of the site as an industrial and/or commercial use in a rural setting, New Castle County zoning policies, state regulations governing water supply and worker health and safety.

Quantitative objectives define specific levels of remedial action to achieve protection of human health and the environment. Based on the qualitative objectives, the quantitative objectives will be to ensure that future site users such as site workers, construction workers, visitors, and trespassers do not come in contact with soils or groundwater that contain elevated levels of PCE

above the established URS values, and to prevent discharge of groundwater containing elevated levels of PCE above URS values for surface water.

Based on the qualitative objectives, the quantitative objectives are:

- Prevent human and ecological exposure to soils and groundwater contaminated by PCE and Phthalates, which were found to be at concentrations above their respective restricted-use URS values.
- Prevent discharge of surface water and sediment contaminates into the Delaware River above Delaware Surface Water Quality Standards.

5.0 FINAL PLAN OF REMEDIAL ACTION

As stated in Section 3.0 of this Final Plan, the soils at the site contain elevated levels of some metals, PCE and Phthalates. The site is currently developed as an industrial process with buildings, parking lots, rail lines and process areas and is expected to remain under the same land use. The final plan for the Kaneka Delaware Corporation site calls for the following actions:

1. Excavate, remove and properly dispose of phthalate-impacted soil within the containment area of the former plasticizer ASTS and replace with a fabric liner and a minimum of two (2) feet of clean fill.

2. Excavate, remove and properly dispose of PCE-impacted soil in the area south and east of the Utilities Building (center of the plant area).

3. Install a liner in the North Ditch area to prevent direct contact exposure to and migration of existing contaminated sediments.

4. Maintain the existing asphalt, concrete and buildings as impermeable covers.

5. Placement of a groundwater management zone (GMZ) at the site. The GMZ is an internal DNREC document restricting the use of groundwater at the site.

6. Placement of a deed restriction on the property within ninety (90) days following DNREC's adoption of the final plan : a) prohibiting current and future residential use of the property; b) prohibiting any digging, drilling, excavating, grading, constructing, earth moving, or any other land disturbing activities on the property without the prior written approval of the DNREC; c) requiring written approval from DNREC prior to any repair, renovation or demolition of the existing paved surfaces and buildings pursuant to the remedy for the site; and d) prohibiting the installation of any water well on, or use of groundwater at, the site without the prior written approval of DNREC, as well as noting that the site is located within a GMZ.

7. Prepare and implement a DNREC-approved Operation & Maintenance plan which outlines the groundwater monitoring requirements and maintenance of the structures, and

the concrete/asphalt and soil caps pursuant to the remedy. Under this plan, groundwater will be monitored for a period of 12 quarters (3 years).

Note: Number 1, 2 and 3 have all been handled as interim actions that have been completed.

6.0 PUBLIC PARTICIPATION

The Department actively solicited public comments or suggestions on the proposed plan and welcomed opportunities to answer questions. The public comment period for the proposed plan began on Monday, November 19, 2003, and concluded at the close of business Monday, December 9, 2003. No written comments or requests for a public hearing were received by DNREC.

7.0 DECLARATION

This final plan of remedial action for the Kaneka Delaware Corporation site is protective of human health, welfare and the environment and is consistent with the requirements of the Delaware Hazardous Substance Cleanup Act.

William W. Hall Acting Director

John Blevins, Director
Division of Air and Waste Management

12-29-03
Date

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Figure 1: Site Location Map

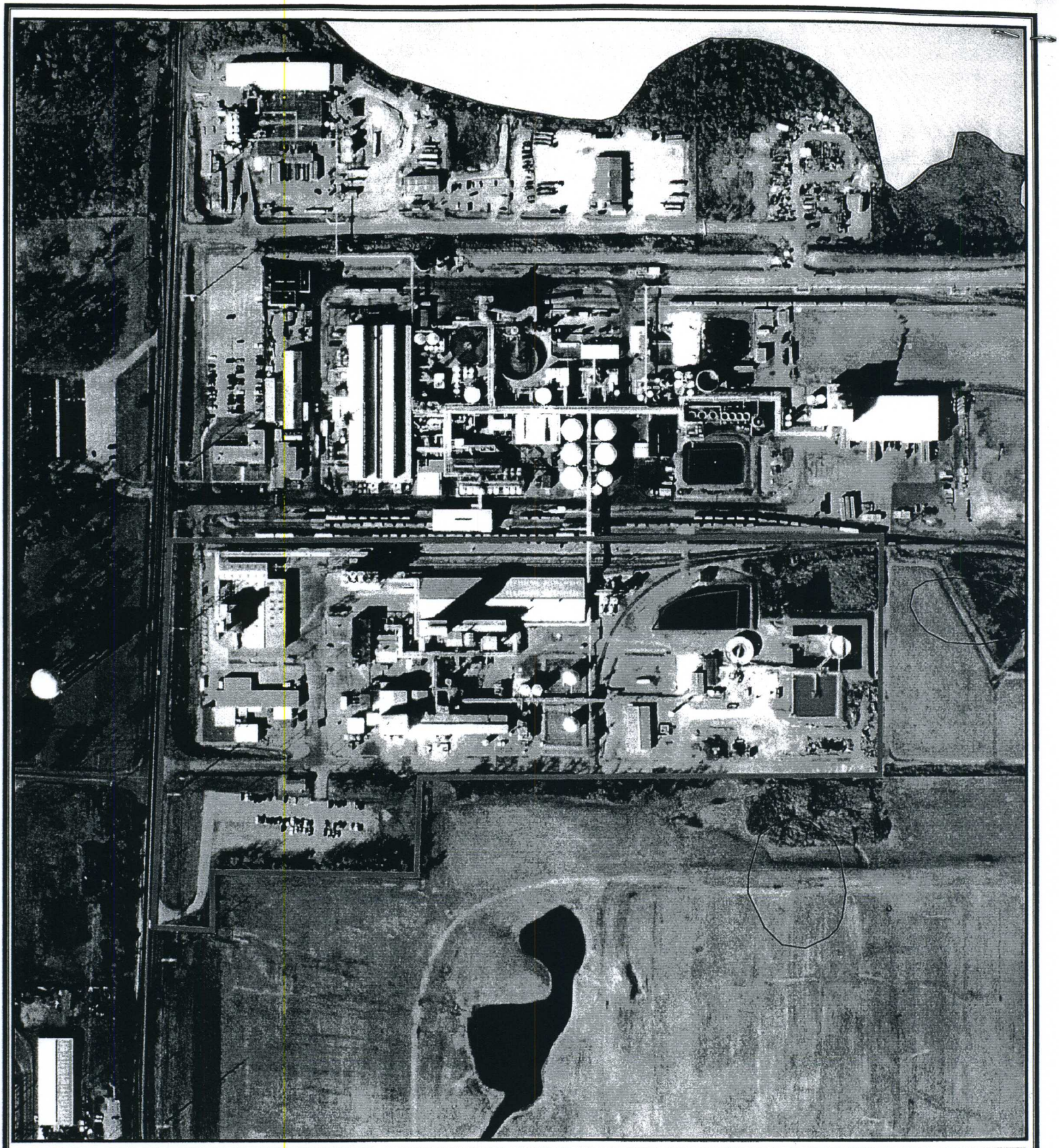
0 0.25 0.5 Miles

0 1 inch equals 1,302 feet

SITE INVESTIGATION &
RESTORATION BRANCH
391 LUKENS DRIVE
NEW CASTLE, DELAWARE 19720-2774
PHONE NUMBER: 302.395.2600

KANEKA SITE
DELAWARE CITY
DELAWARE

Figure 2: Site Detail



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Miles

0 1:3,600 1 inch equals 300 feet 0.1

G/LMK/KANEKA/ATTACHMENT1

SITE INVESTIGATION &
RESTORATION BRANCH
391 LUKENS DR
NEW CASTLE, DE 19720-2774

ATTACHMENT 1
KANEKA
SITE BOUNDARY